Center Innovation Fund: GSFC CIF

Ultrafast Laser material processing

Completed Technology Project (2017 - 2018)

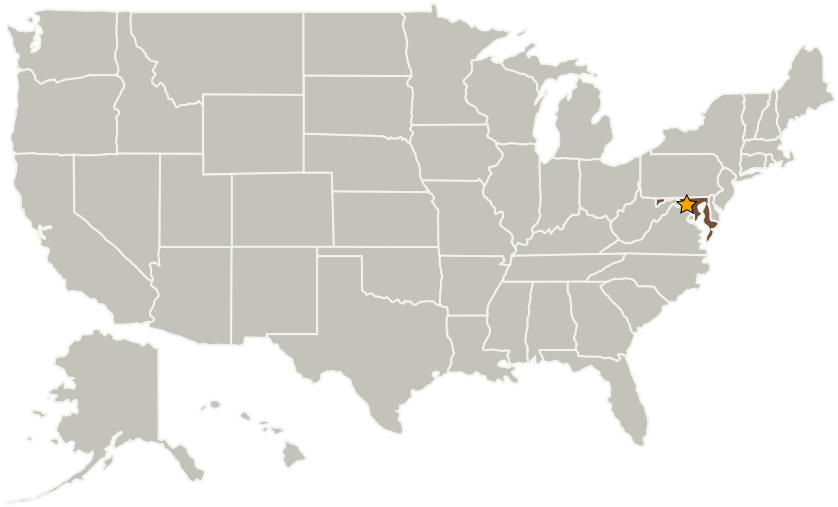
Project Introduction

This is a restart of last years CIF that had to be terminated early. This effort will rigorously study ultrafast laser welding and develop the techniques for reliably performing a weld of Glass to Glass, Glass to Metal, or Glass to Ceramic, such as the case for a thermoelectric cooler. Potential applications will include welding a glass optic to a metal mount, glass optics to ceramic sample, and connecting optical fiber to a collimator. Additionally, the team will investigate the techniques for writing a waveguide inside a glass sample, and look at the factors that influence waveguide loss. Once this effort has been fully demonstrated, future HQ funding opportunities such as ESTO's ACT, IIP, EVIs, EVM's, Planetary Sciences' PIDD, MatiSSE, etc. will be pursued.

Anticipated Benefits

This is a revolutionary, generci technology with multiple uses for sensors, optics, structures, and various devices. It is being pursued vigorously in industry, but not for NASA applications or material selections. This goal of this effort is to leverage the commercial/academic efforts for NASA applications.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland

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Primary U.S. Work Locations
Maryland

Project Website:

https://www.nasa.gov/directorates/spacetech/home/index.html

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Center Innovation Fund: GSFC CIF

Project Management

Program Director:

Michael R Lapointe

Program Manager:

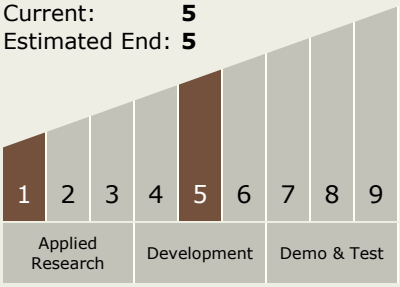
Peter M Hughes

Principal Investigator:

Robert E Lafon

Technology Maturity (TRL)

Start: **1**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX07 Exploration Destination Systems
  - TX07.3 Mission Operations and Safety
    - TX07.3.5 Planetary Protection

Target Destination

Foundational Knowledge